Preservation Planning and ADOT's Historic Bridges

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In Conjunction With

The Federal Highway Administration

FRASERdesign

Loveland, Colorado

Gillespie Dam Bridge, Maricopa County

Arizona State Parks

ADOT

EcoPlan Associates, Inc.

Environmental Science & Resource Economics

The 1987 Bridge Inventory

- Covered 610 bridges and grade separations, on and off the Federal Aid Highway system
- Evaluations were of bridges built prior to 1945
- Did not include railroad bridges, bridges in private ownership, dismantled bridges, or those permanently closed to vehicular traffic

1987 Bridge Inventory

- Done in cooperation with the Historic American Engineering Record (HAER)
- Purpose:
  - to inventory types of vehicular bridges,
  - describe structural configurations and dimensions
  - Present the state of integrity and physical condition with pertinent historical and engineering data

(Fraser 1987:1)

1987 Bridge Inventory as Planning Guidance

- The 1987 Bridge Inventory was also completed to assess all bridges in the inventory for relative significance and potential eligibility for the National Register of Historic Places
- This would allow historically important bridges to be identified in advance of proposed works, including demolition, and provide a base reference for Section 106 (National Historic Preservation Act) and NEPA compliance.

Evaluation Process

- Bridges were evaluated under three National Register Criteria:
  - A: associated with events that have made a significant contribution to the broad patterns of our history;
  - B: associated with the lives of persons significant in our past; and
  - C: embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values.

Evaluation Process, cont'd

- Bridges were then evaluated on a points system based on:
  - level of documentation (max 30 points)
  - technological significance (max 35 points)
  - general significance (max 35 points)

London Bridge, Lake Havasu City

Level of Documentation Scale: 30 points maximum

- Date of construction
  - Pre-1913
    - 15 pts
  - 1913-1920
    - 12 pts
  - 1921-1930
    - 8 pts
  - 1931-1940
    - 4 pts
  - Post-1940
    - 0 pts

- Builder
  - Known, significant Arizona builder
    - 10 pts
  - Known, significant out-of-state builder
    - 8 pts
  - Known Arizona builder
    - 6 pts
  - Known out-of-state builder
    - 4 pts
  - Unknown builder
    - 0 pts

Technological Significance Scale: 35 points maximum

- Based on length and number of spans, types and lengths of trusses, length and types of stringers, length and types of concrete arches, slabs, and girders.
- Points also awarded for the number of surviving types in Arizona
- Points for special features, such as patented features, decorative or distinctive elements, and builder's or dedication plaques

General Significance Scale: 35 points maximum

- Based on Aesthetics of the Setting, Historical Significance, Structural Integrity, and Locational Integrity
- Mirrors the aspects of integrity for evaluating National Register properties (location, design, materials, workmanship, setting, feeling and association).

Central Avenue underpass of the Southern Pacific RR, Phoenix

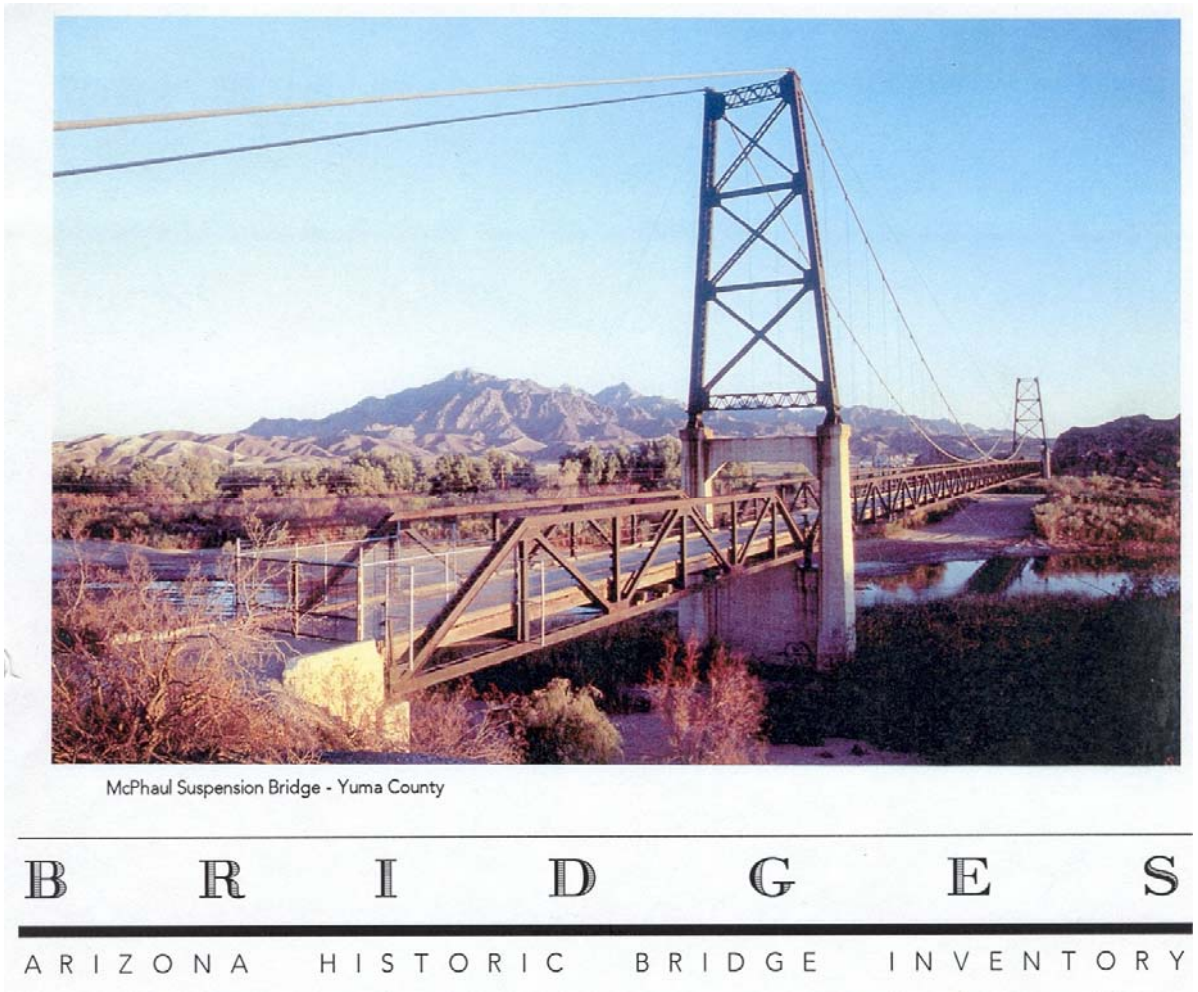
3-Tier System for Evaluating National Register Significance

- **Category 1** (60-100 pts): Eligible for the National Register. Represents unique or rare examples of technologically important types, or bridges with exceptional historical or representational value.
- **Category 2** (35-59 pts): Possibly eligible. Good early examples of types or notable variations from classical configurations
- **Category 3** (1-34 pts): Not eligible. Typical, later examples of common structural types.

Results of 1987 Inventory

- Upon consultation with the Advisory Committee for the historic bridge project (ADOT, FHWA, SHPO, and the National Park Service), Category 2 bridges were eliminated, and placed either in Category 1 (eligible) or Category 3 (not eligible).
- 83 Bridges in the inventory were determined to be eligible for inclusion on the National Register of Historic Places

2004: Updating the Bridge Inventory



2004 Bridge Inventory
The Differences

- Inventory Done as Multiple Property Listing for the National Register of Historic Places
- Time period extended to cover pre-1964 bridges
- Numerical rating system slightly altered from 1987 inventory

Navajo Bridge, Marble Canyon (Coconino County)

Multiple Property Evaluation

- The 2004 bridge inventory used the National Register's **Multiple Property Documentation Form**
- **The multiple property listing** is the name given to the group of properties (in this case, bridges)
- Information common to the group of properties is presented in the Multiple Property Documentation Form, while information specific to each individual building, site, district, structure, or object is placed on an individual Registration Form.
- Once nominated and listed on the National Register, the Multiple Property Documentation Form, together with individual Registration Forms, constitute a **multiple property submission.**

Multiple Property Listing Importance

- Using a format recognized for evaluating properties for the National Register of Historic Places allows ADOT the ability to streamline historic preservation compliance when historic bridges are involved
  - Easy identification of significant bridges
  - Easy identification of properties protected under Section 4(f)
  - Quick reference to the defining characteristics of certain bridge types, as well as a method by which to evaluate integrity makes it easier for the Historic Preservation Team to offer guidance on sensitive design

The New Bridges: 1945-1964

- The addition of bridges built between 1945 and 1964
  - Allows for evaluation of bridges reaching the 50-year threshold for National Register eligibility through 2014.
  - Added an additional Historic Context period – Post-War Construction and the Interstate Highway System

Glen Canyon Bridge under construction, c. 1958

Bridges: 1945-1964

- Some bridges may not seem to be of historic importance, but represent some of the most advance technology of their day
- Due to the later date of construction on these bridges, many are still in their original condition. However, few remain in Arizona today.

Guthrie Bridge over the San Pedro River, east of Safford

Revisions to the Ratings System: Documentation

- Documentation: data ranges were altered to reflect the incorporation of bridges built before 1964.
  - Pre-1918 (15 points)
  - 1918-1932 (12 points)
  - 1933-1941 (8 points)
  - 1942-1954 (4 points)
  - 1955-present (0 points)

Revisions to the Rating System: Significance

- The old Technological and General Significance categories were altered to reflect significance under the different National Register Eligibility Criteria
  - Historical Significance (Criteria A and B) was given a maximum of 35 points
    - Reflects the historic associations of the bridge in relation to Arizona's history.
  - Technological Significance (Criteria C) was also given a maximum of 35 points.
    - Reflects the relative rarity of the type of bridge
- Under this division, the number and types of spans, and the types and lengths of the structures were not as important as they previously were, in favor of historical associations and potential for preservation.

Addition to the Rating System: Structural Integrity

- Each structure begins with 20 points for structural integrity. Points are subtracted for alterations:
  - Minor repairs or in-kind replacement (-5 points)
  - Superstructure moved during historic period (-5 points)
  - Deck widened / guardrails or deck replaced (-10 points)
  - Superstructure moved after historic period (-15 points)
  - Substructure replaced (-15 points)
  - Superstructure replaced (-20 points)

Results

- 2,504 structures were evaluated
- 72 structures were identified as being previously listed on the National Register of Historic Places
- 53 Structures were identified as eligible for the National Register

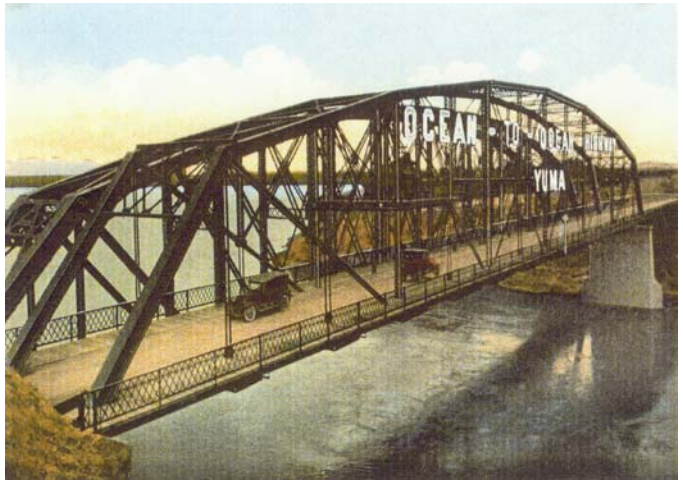
Mill Avenue Bridge, Tempe

Now What?

- Once all revisions are made to the Inventory, it will be submitted to the Historic Sites Review Board for evaluation and submission to the Keeper of the National Register
- Final copies will be produced in CD-ROM format, with limited hard copy distribution.
- Can be used by agencies, consultants, and others for planning, compliance, and research.

Old and New Navajo Bridges, Coconino County

Bridge Rehabilitation



Ocean-to-Ocean bridge, Yuma, from an early postcard

Bridge after rehabilitation

- Bridge Rehabilitation has been done by ADOT, FHWA, and local governments.
- Bridges can be rehabilitated to meet current standards, to function as pedestrian bridges, or even (in some cases) relocated to multi-use paths and other community uses.

For More Information

- FHWA's Historic Bridge web-page
  - http://environment.fhwa.dot.gov/histpres/bridges.asp
- ADOT's Transportation Enhancement Section
  - www.adotenhancement.com

Salt River Canyon Bridges, US 60 North of Globe